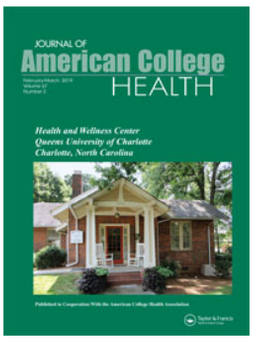

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MAJOR ARTICLE

Transgender college students: Academic resilience and striving to cope in the face of marginalized health

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ABSTRACT

Objective: To examine health behavior and outcome disparities between transgender, female, and male participants in a national sample of US college students. **Participants and Method Summary:** Analyses utilized secondary data from 32,964 undergraduate and graduate students responding to the Fall 2013 American College Health Association–National College Health Assessment; 65.8% were female, 0.4% were transgender, 67.9% were white, and 90.4% were heterosexual. **Results:** Transgender students reported more mental health diagnoses, trauma, and suicidality; experienced more violence and less safety, reported more sex partners and sexually transmitted infections (STIs); higher rates of illicit and nonprescription substance use and binge drinking use while engaging in less harm reduction behavior; and reported more barriers to academic success. **Conclusions:** There is an established need for college clinicians and health educators to reduce these disparate outcomes once students arrive on campus through professional training and culturally competent campus prevention and intervention efforts to promote health equity.

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Alcohol; counseling; gender; health education; mental health; other drugs

Introduction

The Council for the Advancement of Standards in Higher Education (CAS) and the American College Health Association (ACHA) have passed down specific directives regarding transgender inclusion in higher education and college health. CAS specifically states that institutions "must create and maintain educational and work environments that are welcoming, accessible, inclusive, equitable, and free from harassment."[1] Additionally, institutions must not discriminate on the basis of sexual orientation or gender identity, should "modify or remove policies, practices, systems, technologies, facilities, and structures that create barriers or produce inequities," and "address the characteristics and needs of diverse constituents when establishing and implementing" programs and services.[1] ACHA recognizes health professionals as critical supports to increasing student capacity for academic success and therefore published guidelines for trans-inclusive college health programs to "mitigate barriers that transgender students face when accessing mental health, physical health, and preventative services on campus."[2] With these guidelines, ACHA specifically charges health professionals to develop education and prevention strategies to address issues that "disproportionately affect transgender individuals, including but not limited to violence prevention, STI/HIV prevention and treatment, substance abuse prevention and treatment, and mental health issues such as depression, suicidal ideation, and suicide prevention."[2]

It is difficult for college health professionals to meet the charges outlined in ACHA's trans-inclusive best practices because the needs and experiences of transgender people in general, and especially transgender college students, are largely undocumented and unknown. There are three main reasons why this information gap exists. First, the United States Census Bureau and other keepers of official records, including higher education institutions, do not ask about gender identity or allow space for someone to identify outside of the male and female gender binary.[3] Therefore, it is very difficult to estimate the number of transgender individuals[4] and even more difficult to ascertain unique health needs within this community. This lack of federal data severely limits researchers' and practitioners' ability to fully understand the population's strengths and challenges and therefore impedes the development of policies and programs that seek to improve the well being of transgender individuals.[5]

Secondly, most of the data available on transgender young adults are grouped in research on lesbian, gay, bisexual, and transgender (LGBT) youth. While the

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communities grouped together under the umbrella acronym LGBT share some experiences as their marginalization involves sex, gender, and/or sexuality; it is incorrect to assume that these experiences are all the same. The use of the acronym in research treats LGBT health needs and experiences as singular and indistinguishable.[6] While lesbian, gay, and bisexual individuals may experience marginalization because of their sexual orientation, transgender individuals may experience marginalization due to their gender identity or gender expression. Therefore, it is important to acknowledge that transgender students may have specific needs, vulnerabilities, and strengths that may not be captured in the literature that aggregates LGBT experiences.[6]

Third and lastly, it is difficult to ascertain the unique needs of transgender college students because the limited data that we have on this population are not necessarily representative of college students. The largest data set available on transgender health comes from the 2015 U.S. Transgender Survey whose sample included participants from 18–65+ years of age, not specifically a college-aged cohort.[7] In terms of trans youth populations, several of the most cited sources aggregate LGBT youth or focus on K-12 settings. The Family Acceptance Project, while valuable literature surveying young adults, asks for participants to retrospectively comment on their childhood and therefore doesn't capture the young adult experience.[8,9] The GLSEN 2015 National School Climate Survey[10] is a valuable resource documenting the student experience but the data are limited to K-12 school settings and don't capture the experiences and needs of college students. Additionally, due to harassment and mistreatment in K-12 schools, lesbian, gay, bisexual,[10] and transgender[7,10] youth are more likely to drop out and are less likely to pursue postsecondary education than their nonLGBT peers. This further supports the need to understand the characteristics of this possibly unique subset of transgender youth who persist towards college and may not be represented in available literature.

While acknowledging these major limitations, the data available on transgender populations would suggest that transgender college students experience several health disparities, particularly in mental health, experiences of violence, sexual health outcomes, and substance use behavior. For mental health, the Human Rights Campaign survey of LGBT youth found that only 4% of transgender youth reported being "very happy" compared to 27% of straight cisgender[11] males[12] and the 2015 U.S. Transgender Survey found that 39% of respondents reported currently experiencing serious psychological distress.[7] This rate is nearly eight times higher than the general population (5%). The 2015 U.S. Transgender Survey also found that 40% of respondents reported a lifetime suicide attempt compared to 4.6% in the general population.[7]

In regard to experiences of violence, the 2015 National School Climate Survey found that LGBT students reported high rates of harassment in K-12 schools, with 55% reporting verbal harassment, 20% reporting physical harassment, and 9% reporting physical assaults as a direct result of their gender identity.[10] These rates are comparable to those reported by transgender adults, where in the past year 46% reported verbal harassment and 9% reported a physical attack specifically as a result of their gender identity.[7] This violence can be fatal, as records of transgender homicides have been increasing in recent years. 2016 was the deadliest year on record with 27 murders, surpassing 21 murders in 2015. Lack of accurate and reliable data collection makes it challenging for advocates to accurately capture this widespread violence, although we do know that transgender women of color are disproportionately targeted by hate violence and murdered.[13]

Both the Campus Climate Survey on Sexual Assault and Sexual Misconduct[14] and the 2015 U.S. Transgender Survey[7] found that transgender people experience incredibly high rates of sexual violence. The Campus Climate Survey found that when looking at reports of sexual violence since enrolling in college, transgender undergraduate and graduate students have rates comparable or slightly higher than female students, respectively (24.1% vs. 23.1% and 15.5% vs. 8.8%).[14] When looking at adult populations, 10% of respondents reported a sexual assault in the last year and almost half (47%) reported a sexual assault at some point in their lifetime.[7]

When considering sexual health, the National Transgender Discrimination Survey found that transgender adults report nearly five times (1.4%) the national average (0.3%) of HIV infection.[7] The Canadian Trans Youth Health Survey found that transgender youth reported over six times greater likelihood of having been diagnosed with a sexually transmitted infection by a doctor (19%) although they report similar rates of pregnancy as their cisgender peers.[15]

Lastly, transgender youth report almost double the rate of alcohol and drug use experimentation (48%) as their straight cisgender peers.[12] When transgender adult respondents were compared to the general population in regard to alcohol use, they reported marginally higher rates of current use and binge drinking. However, more notable differences are found among marijuana use in both lifetime (64% vs. 47%) and current use (25% vs. 8%). Overall, almost one-third of transgender respondents reported using marijuana, illicit drugs, and/or nonprescription drugs in the past months, compared to 10% of the U.S. population.[7]

These numbers are powerful, but college health educators seeking to adhere to ACHA's trans-inclusive guidelines and support the needs of transgender college students by relying on these data may miss the mark. Transgender youth are more likely to drop out and are less likely to pursue postsecondary education than their cisgender peers.[7,10] Therefore, those that do persist to higher education, particularly in the face of many institutional and social obstacles, are possibly a unique subset of the transgender population. Therefore, college health educators need a better understanding of the specific experiences of transgender college students before assuming their needs and developing and investing in prevention and intervention programs.

The purpose of the current study is to describe the health behaviors and outcomes of transgender college students using data from the American College Health Association – National College Health Assessment (ACHA-NCHA). Specifically, this study will examine the reported behaviors and experiences associated with mental health, violence, sexual health, substance use behavior, and academic performance of transgender, male, and female students. It is hypothesized that transgender college students report disparate health behaviors and outcomes compared to their cisgender peers, as is reflected in the literature.

Methods

Procedure

The National College Health Assessment (NCHA) is a survey administered by the American College Health Association (ACHA) that assesses college students' perceptions and health behaviors regarding nutrition, exercise, mental health, substance use, personal safety, sexual health, and academic outcomes. ACHA-NCHA is conducted every fall and spring semester at both two-year and four-year public and private institutions across the country. Since its first survey period in 2000, the ACHA-NCHA has assessed the health perceptions, behaviors, and outcomes of more than 1.4 million students at 740+ colleges and universities.[16]

While ACHA-NCHA databases cannot be generalizable to all schools and students in the United States because participating schools are self-selecting, ACHA-NCHA has been appraised as reliable, valid, and of empirical value for representing the nation's students.[17–20] While there is no standardized way that schools administer the ACHA-NCHA survey, only schools that randomly select students or classrooms to survey are part of the national databases.[20]

This study secured a data use agreement with ACHA to complete secondary data analyses on the fall 2013 data set, thus, Institutional Review Board approval was not required to complete these analyses. The shared data contain information from 32,964 undergraduate and graduate students enrolled at 57 colleges and universities. Of these participants, 65.8% identified as female (n = 21,170), 33.8% identified as male (n = 10,871), and 0.4% identified as transgender (n = 116). This proportion of transgender students is approximately the same as estimates of transgender people in the United States, which is 0.6% of adults or 1.4 million individuals.[4]

Due to the small proportion of transgender students in the overall sample and the benefits of having a larger sample to achieve statistical power, no exclusion criteria were applied in these analyses. The data showed that most respondents were white (67.9%), heterosexual (90.4%), and full-time students (92.1%). Almost 25% of respondents were first-year undergraduate students. Most participants were 18, but the mean age was 22.6 due to graduate students and some nontraditionally aged student respondents who were included in analyses. See Table 1 for additional demographic characteristics of the sample.

Table 1. Characteristics of American College Health Association – National College Health Assessment (ACHA-NCHA) Participants (N = 32,964).

Characteristic	Frequency	% Valid
Age in years	Mean = 22.57, Mode = 18, SD = 6.45	
Gender (N = 32,157)		
Female	21,170	65.8%
Male	10,871	33.8%
Transgender	116	0.4%
Race/Ethnicity (N = 32,964)		
White	22,395	67.9%
Black	2,736	8.3%
Hispanic/Latino	4,331	13.1%
Asian/Pacific Islander	3,544	10.8%
American Indian	551	1.7%
Biracial	1,150	3.5%
Other	971	2.9%
Year in school (N = 31,989)		
First year undergraduate	7,921	24.8%
Second year undergraduate	5,692	17.8%
Third year undergraduate	5,971	18.7%
Fourth year undergraduate	4,935	15.4%
Fifth year or more undergraduate	1,575	4.9%
Graduate or Professional	5,584	17.5%
Not degree seeking/Other	311	1.0%
Sexual Orientation (N = 31,970)		
Heterosexual	28,891	90.4%
Gay/Lesbian	968	3.0%
Bisexual	1,348	4.2%
Unsure	763	2.4%
Enrollment Status (N = 32,089)		
Full-time	29,562	92.1%
Part-time	2,251	7.0%
Other	276	0.9%

Measures

Mental health

Mental health was assessed on the ACHA-NCHA in several ways. Respondents were asked about mental health symptoms, history of diagnosis and treatment, trauma and difficulty coping, overall stress, and utilization of campus mental health services.

Mental health symptoms was assessed by asking about depression (through sum scores of *"Have you ever felt: things were hopeless? very lonely? very sad? so depressed it was difficult to function?*), anxiety (*"Have you ever felt overwhelming anxiety?*), self-harm (*"Have you ever intentionally cut, burned, bruised, or otherwise injured yourself?*), suicidal ideation (*"Have you ever seriously considered suicide?*), and suicide attempts (*"Have you ever attempted suicide?"*). Respondents chose a response indicating that they have: a) never experienced; b) experienced but not in the last 12 months; c) experienced in the last 2 weeks; d) experienced in the last 30 days; or e) experienced in the 12 months. Researchers combined categories, dichotomized, and recoded this experience (0 = never experienced, 1 = ever experienced at any time). For the depression scale, the four individual items were combined into a sum score with a range of 0–4 with a higher score indicating more depression symptoms. For the remaining symptoms, scores were 0 (never experienced) and 1 (experienced).

History of diagnosis and treatment was assessed by asking *"Within the last 12 months, have you been diagnosed or treated by a professional for any of the following: Anxiety? Bipolar Disorder? Depression? Panic Attacks?"* Each diagnosis was separately analyzed. Respondents chose a response indicating that they have: a) never been diagnosed or treated; b) were diagnosed but not treated; c) diagnosed and treated with medication; d) diagnosed and treated with psychotherapy; e) diagnosed and treated with medication and psychotherapy; or f) diagnosed and treated with another treatment. This scale was collapsed to: 0) never been diagnosed or treated; 1) diagnosed but not treated; and 2) diagnosed and treated, because these responses provided more clinically significant results than assessing the various forms of treatment on the 6-point categorical scale.

Trauma and difficulty coping was assessed by asking *"Within the last 12 months, have any of the following been traumatic or very difficult for you to handle: personal relationships (*through sum scores of *family problems*, *intimate relationships*, and *other social relationships), finances, personal appearance, health, and sleep?"* Dichotomous response options were provided for each of these measures (0 = no, 1 = yes). The personal relationship index included a range of 0–3 with a higher score indicating more personal relationship difficulty.

Overall level of stress was assessed by asking, *"Within the last 12 months, how would you rate the overall level of stress you have experienced?"* Respondents selected from an interval scale that ranged from 1–5 with one being no stress and five being tremendous stress. This 5-point scale was maintained.

Utilization of campus mental health services was assessed by asking, *"Have you ever received psychological or mental health services from your current college/university Counseling or Health Service?"* Dichotomous response options were provided for this measure (0 = no, 1 = yes).

Violence & safety

Matters of violence and safety were assessed in four ways; experience of physical assault, experience of sexual assault, experience of verbal threats, and perceptions of safety on campus.

Physical assault was assessed by asking *"Within the last 12 months: Were you physically assaulted?"* Dichotomous response options were provided for this measure (0 = no, 1 = yes).

Sexual assault was assessed by the sum scores of these three questions, *"Within the last 12 months: Were you sexually touched without your consent? Was sexual penetration attempted without your consent? Were you sexually penetrated without your consent?"* Dichotomous response options were provided for this measure (0 = no, 1 = yes). The sexual assault scale included a range of 0–3 with a higher score indicating more experiences of sexual violence.

Verbal threats was assessed with the question, *"Within the last 12 months: Were you verbally threatened?"* Dichotomous response options were provided for these measures (0 = no, 1 = yes).

Perceptions of safety was assessed with the questions, *"How safe do you feel: On this campus (daytime)? On this campus (nighttime)?"* Respondents selected an answer from an interval scale ranging from 1–4 with one being not at all safe and four being very safe. These two questions were separately analyzed and the scale was maintained.

Sexual health

Sexual health was measured by assessing: number of sexual partners; sexual activity in last 30 days, condom use in last 30 days, and STI/HIV status.

Number of sexual partners was assessed with the question, "*Within the last 12 months, with how many partners have you had oral sex, vaginal intercourse, or anal intercourse?"* Students wrote in the exact number of partners and the full range was 0–90. Because the variable was not normally distributed, it was recoded into three catego-

ries: a) 0 partners in the last 12 months; b) 1–2 partners in the last 12 months; and c) 3 or more partners in the last 12 months. Approximately 14% of the total participants reported 3 or more partners in the last year.

Sexual activity in last 30 days was assessed by asking, *"Within the last 30 days, did you have: Oral sex? Vaginal intercourse? Anal intercourse?"* Respondents selected from three categories: a) no, never done this activity; b) have done this activity but not in last 30 days; and c) yes, have done this activity in last 30 days. This scale was then recoded to isolate those that engaged in sexual activity in the last 30 days (0 = never done this activity or have done this activity but not in last 30 days, 1 = have done this activity in last 30 days). It should be noted that the genitalia of participants and their partners is not known nor should it be assumed. These three sexual activities were separately analyzed in order to pair them with their corresponding condom use behaviors.

Condom use in last 30 days was assessed by asking *"Within the last 30 days, how often did you or your partner(s) use a condom or other protective barrier for: Oral sex? Vaginal intercourse? Anal intercourse?"* Respondents selected an answer from a scale including: a) N/A never did this sexual activity; b) have done this sexual activity but not in last 30 days; c) never used; d) rarely used; e) sometimes used; f) most of the time used; and g) always used. The respondents that reported never did this activity or have not done this activity in the last 30 days were dropped from the analyses to isolate the condom use behaviors of those engaging in sexual contact in the last 30 days. The scale was reformatted to a 3-point scale of: 0) never; 1) sometimes; and 2) always because it was determined not clinically significant to isolate the subjective different experiences of "sometimes" and "mostly" using condoms.

STI and HIV status was assessed by asking, *"Within the last 12 months, have you been diagnosed or treated by a professional for any of the following: Chlamydia? Genital herpes? Genital warts/HPV? Gonorrhea? Hepatitis B or C? HIV?"* Each infection and disease was separately analyzed. Dichotomous response options were provided for these measures (0 = no, 1 = yes).

Substance use

Substance use was measured by assessing: substance use in last 30 days, binge drinking, nonprescription substance use, substance abuse or addiction treatment, and harm reduction behaviors.

Substance use in last 30 days was assessed by asking *"Within the last 30 days, on how many days did you use: Alcohol? Marijuana? Cocaine? Methamphetamine? Opiates? MDMA?"* Respondents' options were on an 8 point scale ranging from "never uses: (1) to "use daily" (8). Due to the small sample size of transgender students, responses were recoded to 0 = never used, 1 = ever used. Cocaine, methamphetamine, opiates, and MDMA were combined for one illicit drugs index with a range of 0–4 with a higher score indicating more illicit drug use.

Binge drinking was measured with the question, *"Over the last two weeks, how many times have you had five or more drinks of alcohol in a sitting?"* Students selected responses from an interval scale that ranged from 1–12, with one being N/A – don't drink and 12 being 10 or more times. The respondents that reported that they don't drink were dropped from the analyses to examine the binge drinking behaviors of those that do drink. The scale was then recoded 0 – 10 (0 = zero times; 10 = 10 or more times).

Nonprescription substance use was assessed by asking, *"In the last 12 months, have you taken any of the following prescriptions that were not prescribed to you? Antidepressants? Painkillers? Stimulants?"* Each substance was separately analyzed and dichotomous response options were provided for these measures (0 = no, 1 = yes). These three measures were then combined into an index with a range of 0–3 with a higher score indicating more nonprescription drug use.

Substance abuse or addiction treatment was assessed by asking, *"Within the last 12 months, have you been diagnosed or treated by a professional for substance abuse or addiction?"* Respondents chose a response indicating that: a) they have never been diagnosed or treated; b) were diagnosed but not treated; c) diagnosed and treated with medication; d) diagnosed and treated with psychotherapy; e) diagnosed and treated with medication and psychotherapy; or f) diagnosed and treated with another treatment. The researchers re-categorized this scale to: 0) never been diagnosed or treated; 1) diagnosed but not treated; and 2) diagnosed and treated, as these options were thought to provide more clinically significant results than separately assessing the various forms of treatment on the 6-point categorical scale.

Harm reduction behaviors for alcohol use was assessed by asking, *"During the last 12 months, when you 'partied'/socialized, how often did you: Alternate nonalcoholic with alcoholic beverages? Avoid drinking games? Set a number of drinks to not exceed? Keep track of how many drinks you were having? Pace your drinks to 1 or fewer per hour? Have a friend let you know when you have had enough? Stay with the same group of friends the entire time you were drinking? Use a designated driver?"* For all questions, respondents selected an interval scale that ranged from 1–6, with 1 being N/A – don't drink and 6 being always. The respondents that reported that they do not drink were dropped from the analyses to isolate the harm reduction behaviors of those engaging in

drinking behavior in the last 12 months. Individual measures were then reformatted to a 3-point scale of: 0) never; 1) sometimes; and 2) always because the researchers determined there to be no clinically significant benefit to separately evaluating the difference between rarely and sometimes engaging in a behavior. These measures were then combined into an index with a range of 0–16 with a higher score indicating more harm reduction behaviors for alcohol use.

Academic performance

The ACHA-NCHA assessed academic performance by looking at impairments to academic performance and grade point average (GPA) scores.

Impairments to academic performance was assessed by asking "*Within the last 12 months, have any of the following affected your academic performance: Anxiety? Depression? Eating disorder/problem? Relationship difficulties? Sleep difficulties? Stress? Physical assault? Sexual assault? Discrimination? Sexually transmitted infection/disease? Alcohol use? Drug use?*" Each experience and behavior was analyzed separately. Respondents chose either a response indicating that: a) this did not happen to them; b) that they experienced this issue but my academics were not affected; c) that they experienced this issue and as a result received a lower grade on an exam or an important project; d) that they experienced this issue and as a result received a lower grade in a course; e) that they experienced this issue and as a result received an incomplete or dropped a course; or f) that they experienced this issue and as a result had significant disruption in thesis, dissertation, research, or practicum work. Researchers re-categorized this scale to: 0) this did not happen to me; 1) this did happen to me but my academics were not affected; and 2) this did happen to me and my academics were affected, as these options were thought to provide more clinically significant results than assessing the various categorical ways that the experience impacted their performance. The range for this scale is 0–2, with higher scores indicating more academic impairment.

GPA scores was assessed by asking students, "*What is your approximate cumulative GPA?*" Response options for this measure include: 1) A, 2) B, 3) C, 4) D/F, or 5) N/A. Students who reported N/A were excluded from analyses and the scale was re-categorized so that a higher number would indicate higher grades (1 = D/F, 4 = A).

Results

In sum, 53 variables were tested across five categories: mental health; violence and perceptions of safety; sexual health; substance use; and academic performance. Chi-square was used to analyze differences between transgender students and their female and male peers on dichotomous measures, while ANOVA with Tukey follow-up was used to analyze ordinal variables. Transgender students served as the reference group for all analyses.

Mental health

Transgender students report significantly more mental health symptoms when compared to their cisgender peers (see Table 2 for group percentages). Compared to female

Table 2. Mental health experiences and outcomes for NCHA-ACHA participants, Fall 2013.

Mental health symptoms	Percent yes or mean score (std dev) Transgender (ref)	Percent yes or mean score (std dev) Percent Women
Anxiety ($N = 31,851$)	82.6%	70.2%***
Self-harm ($N = 31,880$)	59.1%	20.2%***
Suicidal ideation ($N = 31,891$)	67.0%	22.4%***
Suicide attempts ($N = 31,791$)	32.2%	9.7%***
Depression ($N = 31,496$)[a]	3.357 (1.327)	2.819 (1.476)***
Stress ($N = 31,911$) [b]	3.9 (1.043)	3.6 (.806)***
Trauma and coping		
Personal appearance ($N = 31,867$)	56.5%	26.9%***
Personal health issue ($N = 31,848$)	52.6%	20.4%***
Sleep ($N = 31,876$)	46.5%	27.3%***
Finances ($N = 31,864$)	44.3%	35.7%
Utilzation of mental health resources ($N = 31,844$)	46%	17%***
Personal relationships ($N = 31,758$) [c]	1.552 (1.160)	.881 (.996)***
History of diagnosis and treatment		
Depression ($N = 31,812$) [d]	.82 (.927)	.23 (.625)***
Anxiety ($N = 31,816$) [d]	.68 (.884)	.28 (.671)***
Bipolar ($N = 31,818$) [d]	.24 (.587)	.03 (.222)***

[a]Means and standard deviations for depression scale (range = 0–4) with higher scores indicating more depressive symptoms.
[b]Means and standard deviations for stress scale (range = 1–5) with higher scores indicating more stress.
[c]Means and standard deviations for personal relationship index (range = 0–3) with higher scores indicating more relationship difficulty.
[d]Means and standard deviations for diagnosis and treatment scale (range = 0–2) with higher scores indicating more diagnosis and treatment.
***$p \leq .001$.

and male students, transgender students report significantly more experiences of anxiety (x^2 (1, N = 21,090) = 8.472, p = .004 and x^2 (1, N = 10,876) = 31.375, p < .001, respectively) self-harm (x^2 (1, N = 21,121) = 106.845, p < .001 and x^2 (1, N = 10,874) = 193.522, p < .001), suicidal ideation (x^2 (1, N = 21,127) = 129.902, p < .001 and x^2 (1, N = 10,879) = 160.384, p < .001) and suicide attempts (x^2 (1, N = 21,054) = 65.499, p < .001 and x^2 (1, N = 10,852) = 99.719, p < .001). Furthermore, a significant difference in depression was found among transgender, female, and male students (F (2, 31,493) = 222.468, p < .001) and stress (F (2, 31,908) = 356.648, p < .001) than other students. A Tukey post hoc test of pairwise comparisons indicated that transgender students reported significantly more depression when compared to both female (p < .001) and male (p < .001) students. Similarly, a Tukey post hoc test demonstrated that transgender students reported significantly higher levels of stress when compared to both female (p < .001) and male (p < .001) peers.

Transgender students experienced more trauma and challenges coping with several facets of life when compared to their cisgender peers (see Table 2 for group percentages and means). Transgender students report significantly more experiences of trauma and difficulty coping when compared to female and male students, respectively, in regard to personal appearance (x^2 (1, N = 21,111) = 50.82, p < .001 and x^2 (1, N = 10,871) = 156.816, p < .001), personal health issues (x^2 (1, N = 21,106) = 72.028, p < .001 and x^2 (1, N = 10,856) = 153.079, p < .001), and sleep (x^2 (1, N = 21,122) = 20.956, p < .001and x^2 (1, N = 10,868) = 36.191, p < .001). Nearly half of all transgender students reported trauma and difficulty coping with finances (see Table 2), which is not significantly higher than women (x^2 (1, N = 21,114) = 3.744, p = .053) but significantly higher than men (x^2 (1, N = 10,865) = 14.375, p < .001). Additionally, a significant difference in personal relationship trauma was found among transgender, female, and male students (F (2, 31,755) = 243.812, p < .001). A Tukey post hoc test demonstrated that transgender students reported significantly higher levels of personal relationship trauma when compared to both female (p < .001) and male (p < .001) students.

Almost half of all transgender students surveyed reported that they have utilized campus mental health services to cope with these various stressors and experiences (see Table 2 for group means). This rate is significantly higher than both female and male students' utilization of such services (x^2 (1, N = 21,094) = 66.363, p < .001 and x^2 (1, N = 10,863) = 126.889, p < .001, respectively). Furthermore, significant differences in experiences of being diagnosed or treated with mental health issues was found among transgender, female, and male students for depression (F (2, 31,809) = 161.091, p < .001), anxiety (F (2, 31,809) = 204.652, p < .001), and bipolar disorder (F (2, 31,815) = 60.672, p < .001). A Tukey post hoc test of pairwise comparisons was applied to each of these four measures and demonstrated that transgender students report significantly more of these outcomes than both female (p < .001) and male students (p < .001).

Violence and perceptions of safety

Transgender students report generally higher rates of violence and lower perceptions of safety than their peers (see Table 3 for group percentages and means). Compared to female and male students, transgender students report significantly more physical assault (x^2 (1, N = 21,244) = 34.809, p < .001 and x^2 (1, N = 10,954) = 22.596, p < .001, respectively), verbal threats (x^2 (1, N = 21,226) = 66.158, p < .001 and x^2 (1, N = 10,945) = 28.282, p < .001), and sexual assault (F (2, 31,905) = 168.556, p < .001). A Tukey post hoc test demonstrated that transgender students reported significantly higher levels of sexual assault when compared to both female (p < .001) and male (p < .001) students.

There were significant differences in regard to perceptions of safety on campus during the day among

Table 3. Experiences of violence and perceptions of safety on campus for NCHA-ACHA participants, Fall 2013.

Experiences of violencex	Percent yes or mean score (std dev) Transgender (ref)	Percent yes or mean score (std dev) Women	Percent yes or mean score (std dev) Men
Physical assault (N = 32,083)	13%	3.2%***	4.1%***
Sexual assault (N = 31,908)[a]	.407 (.893)	.128 (.486)***	.043 (.271)***
Verbally threatened (N = 32,056)	41.7%	14.7%***	21.3%***
Perceptions of safety on campus			
Daytime (N = 32,032)[b]	3.56 (.852)	3.83 (.413)***	3.88 (.382)***
Nighttime (N = 31,958)[b]	3.06 (.976)	2.99 (.778)	3.44 (.692)***

[a]Means and standard deviations for sexual violence scale (range = 0–3) with higher scores indicating more sexual violence.
[b]Means and standard deviations for safety scale (range = 1–4) with higher scores indicating more safety.
***$p \leq .001$.

transgender, female, and male students (F (2, 32,029) = 68.995, $p < .001$) (see Table 3 for group means). A Tukey post hoc test demonstrated that transgender students reported significantly less sense of safety during the day time when compared to both female ($p < .001$) and male ($p < .001$) students. However, female students reported feeling the least safe on campus at night when compared to transgender and male students (F (2, 31,955) = 1275.959, $p < .001$). A Tukey post hoc test demonstrated that female students' sense of safety at night was significantly less than reports from their male ($p < .001$) but not their transgender peers ($p = .600$).

Sexual health

There were significant differences in number of sex partners among transgender, female, and male students (F (2, 31,722) = 109.518, $p < .001$) with a Tukey post hoc test indicating that transgender students have significantly more partners than both female ($p < .001$) and male ($p < .001$) students (see Table 4 for group means and percentages). However, when compared to female and male students, respectively, they do not report any differences in oral (x^2 (1, $N = 21,013$) = 0.481, $p = .488$ and x^2 (1, $N = 10,834$) = 0.004, $p = .947$) or vaginal sexual activity (x^2 (1, $N = 20,990$) = 0.629, $p = .428$ and x^2 (1, N = 10,796) = 0.099, $p = .753$). While the ANOVA comparing all groups demonstrated significant differences between transgender, female, and male students' use of condoms during oral (F (2, 14,919) = 4.222, $p = .015$) and vaginal sex (F (2, 15,667) = 21.057, $p < .001$), a Tukey post hoc test indicated that transgender students' use of condoms during oral and vaginal sex is not significantly different than female ($p = .366$, $p = .541$) or male use ($p = .572$, $p = .161$), respectively.

However, transgender students do report significantly more anal sex behavior when compared to women and men, (x^2 (1, $N = 20,862$) = 18.136, $p < .001$ and x^2 (1, $N = 10,706$) = 7.087, $p = .008$, respectively). Additionally, there are differences in condom use during anal sex among participants which demonstrate that transgender students report the highest levels of use (F (2, 3,410) = 55.164, $p < .001$). A Tukey post hoc test demonstrated that transgender condom use during anal sex was significantly higher than reports from their female ($p < .001$) but not their male peers ($p = .540$).

All measured sexually transmitted infections and HIV were found to significantly impact transgender students more than their cisgender peers (see Table 4 for group means). When compared to female and male students, transgender students report significantly higher rates of chlamydia (x^2 (1, $N = 21,125$) = 22.823, $p < .001$ and x^2 (1, $N = 10,872$) = 32.29, $p < .001$, respectively), genital herpes (x^2 (1, $N = 21,107$) = 71.853, $p < .001$ and x^2 (1, $N = 10,856$) = 98.48, $p < .001$), HPV (x^2 (1, $N = 21,105$) = 41.107, $p < .001$ and x^2 (1, $N = 10,868$) = 78.776, $p < .001$), gonorrhea (x^2 (1, $N = 21,113$) = 331.28, $p < .001$ and x^2 (1, $N = 10,848$) = 164.093, $p < .001$), hepatitis B or C (x^2 (1, $N = 20,986$) = 142.779, $p < .001$ and x^2 (1, $N = 10,809$) = 82.328, $p < .001$), and HIV (x^2 (1, $N = 21,089$) = 272.178, $p < .001$) and x^2 (1, $N = 10,843$) = 132.516, $p < .001$).

Substance use

When compared to their female and male peers, respectively, transgender students report significantly more

Table 4. Sexual health behaviors and outcomes for NCHA-ACHA participants, Fall 2013.

Sexual activity	Percent yes or mean score (std dev) Transgender (ref)	Percent yes or mean score (std dev) Women	Percent yes or mean score (std dev) Men
1–2 sex partners ($N = 16,883$)	43.4%	55.1%**	49.6%
3+ sex partners ($N = 4,317$)	22.6%	11.9%**	16.9%
Oral sex ($N = 31,731$)	47.4%	41.8%	42.7%
Vaginal sex ($N = 31,672$)	41.2%	48%	43.5%
Anal sex ($N = 31,456$)	24.1%	4%***	6.9%***
Condom use			
Oral sex ($N = 14,922$)[a]	.241 (.540)	.157 (.467)	0.178 (.490)
Vaginal sex ($N = 15,670$)[a]	.902 (.878)	1.021 (.805)	1.108 (.793)
Anal sex ($N = 3,413$)[a]	.949 (.916)	.520 (.781)***	.809 (.850)
Sexually transmitted infections (STIs)			
Chlamydia ($N = 31,882$)	6.10%	1.2%***	0.9%***
Genital herpes ($N = 31,848$)	7.80%	0.8%***	0.5%***
HPV ($N = 31,858$)	7.80%	1.2%***	0.7%***
Gonorrhea ($N = 31,847$)	9.60%	0.3%***	0.5%***
Hep B or C ($N = 31,681$)	7%	0.3%***	0.5%***
HIV ($N = 31,820$)	8%	0.2%***	0.4%***

[a]Means and standard deviations for condom use scale (range = 0–2) with higher scores indicating more condom use.
**$p \leq .002$. ***$p \leq .001$.

Table 5. Substance use behaviors and outcomes for NCHA-ACHA participants, Fall 2013.

Substance use behaviors and outcomes	Percent yes or mean score (std dev) Transgender (ref)	Percent yes or mean score (std dev) Women	Percent yes or mean score (std dev) Men
Alcohol use ($N = 31,855$)	77.40%	75.10%	75.20%
Marijuana use ($N = 31,906$)	45.20%	31.2%***	36.50%
Other illicit drugs ($N = 31,605$)[a]	.526 (1.235)	.112 (.475)***	.201 (.669)***
Binge drinking ($N = 23,720$)[b]	1.803 (3.322)	.706 (1.302)***	1.294 (1.872)***
Nonprescription use ($N = 31,564$)[c]	.439 (.932)	.140 (.450)***	.154 (.476)***
Diagnosis/treatment ($N = 31,824$)[d]	.174 (.500)	.014 (.160)***	.023 (.205)***
Harm reduction behaviors ($N = 21,491$)[e]	8.273 (4.288)	9.818 (2.843)***	8.389 (2.933)

[a]Means and standard deviations for illicit drug index (range = 0–4) with a higher score indicating more drug use.
[b]Means and standard deviations for binge drinking scale (range = 0–10) with a higher score indicating more binge drinking.
[c]Means and standard deviations for nonprescription substance use index (range = 0–3) with a higher score indicating more nonprescription drug use.
[d]Means and standard deviations for substance abuse diagnosis or treatment (range = 0–2) with a higher score indicating more diagnosis and treatment.
[e]Means and standard deviations for harm reduction behavior index (range = 0–16) with a higher score indicating more harm reduction behaviors.
***$p \leq .001$.

illicit substance use (F (2, 31,602) = 118.411, $p < .001$), binge drinking (F (2, 23,717) = 405.255, $p < .001$), and nonprescription substance use (F (2, 31,561) = 26.663, $p < .001$) (see Table 5 for group percentages). A Tukey post hoc test was applied to each of these three measures and demonstrated that transgender students report significantly more use in each outcome when compared to both female ($p < .001$) and male students ($p < .001$). Nearly half of all transgender students reported marijuana use, which is not significantly different than men (x^2 (1, $N = 10,889$) = 3.764, $p = .052$) but significantly higher than women (x^2 (1, $N = 21,132$) = 10.458, $p < .001$). There are no significant differences in how transgender students use alcohol use when compared to their female (x^2 (1, $N = 21,105$) = 0.313, $p = .576$) and male peers (x^2 (1, N = 10,865) = 0.300, $p = .584$).

In addition, transgender students report significantly more experiences of substance abuse and addiction when compared to their cisgender peers (F (2, 31,821) = 53.711, $p < .001$). A Tukey post hoc test indicated that transgender students experience significantly more substance abuse and addiction when compared to female ($p < .001$) and male students ($p < .001$). Furthermore, transgender students reported the least alcohol harm reduction behaviors when compared to their peers (F (2, 21,488) = 593.566, $p < .001$) (see Table 5 for group means). A Tukey post hoc test demonstrated that transgender students' reports of alcohol harm reduction behaviors are not significantly different than the behaviors reported by men ($p = .943$) but are significantly less than the behaviors reported by women ($p < .001$).

Academic performance

Transgender students reported more impairment to academic performance when compared to their cisgender peers (see Table 6 for group means). There were significant differences in regard to impairments to academic success among transgender, female, and male students in regard to experiences of discrimination (F (2, 31,711) = 233.081, $p < .001$), physical assault (F (2, 31,692) = 89.577, $p < .001$), sexual assault (F (2, 31,665) = 98.947, $p < .001$), depression (F (2, 31,685) = 111.740, $p < .001$), anxiety (F (2, 31,749) = 320.733, $p < .001$), drug use (F (2, 31,718) = 186.084, $p < .001$), eating disorders (F (2, 31,729) = 63.323, $p < .001$), relationship difficulties (F (2, 31,667) = 41.184, $p < .001$), STIs (F (2, 31,688) = 52.276, $p < .001$), sleep (F (2, 31,781) = 76.679, $p < .001$), and stress (F (2, 31,732) = 357.756, $p < .001$). A Tukey post hoc test of pairwise comparisons was applied to each of these 11 outcomes and demonstrated that transgender students experience each of these as impairments to academic performance significantly more than both female ($p < .001$) and male students ($p < .001$). While there were significant differences in regard to alcohol use (F (2, 31,873) = 42.227, $p < .001$), it was the only outcome out of 12 for which a Tukey post hoc test indicated significantly more impairment compared to female ($p = .019$) but not male students ($p = .261$).

Despite these significant impairments to academic performance, there were no significant differences between the estimated GPA of transgender students and their peers (F (2, 30,256) = 1.067, $p = .344$). While not indicated in Table 6 because overall differences in GPA scores were not found to be significant among groups, transgender students were more likely to report GPA scores on the high and low extremes. When compared to female and male students respectively, 50.5% of transgender students reported "A" GPA scores compared to 43.9% and 44.9%, and 5.5% reported "D/F" GPA scores compared to 0.5% and 0.6%.

Comments

Transgender students are generally reporting more negative health outcomes in every health category when

Table 6. Academic performance measures for NCHA-ACHA participants, Fall 2013.

Impairments to academic success	Mean score (std dev) Transgender (ref)	Mean score (std dev) Women	Mean score (std dev) Men
Alcohol use ($N = 31,867$)[a]	.52 (.641)	.38 (.538)*	.44 (.568)
Anxiety ($N = 31,752$)[a]	1.20 (.781)	.72 (.805)***	.50 (.733)***
Physical Assault ($N = 31,695$)[a]	.30 (.612)	.03 (.207)***	.03 (202)***
Sexual Assault ($N = 31,668$)[a]	.30 (.623)	.05 (.257)***	.02 (.183)***
Depression ($N = 31,688$)[a]	1.10 (.862)	.40 (.704)***	.32 (.646)***
Discrimination ($N = 31,714$)[a]	.65 (.704)	.07 (.283)***	.07 (.290)***
Drug Use ($N = 31,721$)[a]	.27 (.601)	.06 (.270)***	.13 (.397)***
Eating Disorders/problem ($N = 31,732$)[a]	.23 (.549)	.07 (.310)***	.04 (.235)***
Relationship difficulties ($N = 31,670$)[a]	.69 (.788)	.40 (.647)***	.34 (.614)***
STIs ($N = 31,691$)[a]	.18 (.523)	.02 (.164)***	.02 (.171)***
Sleep ($N = 31,784$)[a]	1.17 (.858)	.73 (.774)***	.63 (.770)***
Stress ($N = 31,735$)[a]	1.33 (.760)	1.08 (.724)***	.85 (.767)***
Measures of academic success	**Transgender (ref)**	**Women**	**Men**
GPA scores b	3.248 (.665)	3.341 (.657)	3.339 (.676)

[a]Means and standard deviations for academic impairment scale (range = 0–2) with higher scores indicating more impairment.
[b]Means and standard deviations for GPA scale (range = 1–4) with higher scores indicating higher GPA.
*$p \leq .05$ ***$p \leq .001$.

compared to female and male peers: mental health, violence and safety, sexual health, and substance use. These findings are consistent with the literature of both transgender youth and transgender adults.

Transgender students are striving to cope. Almost half of those surveyed utilized their campus mental health services. Transgender students are looking to campus services for support in navigating and coping with their numerous stressors. While a problematic coping strategy, transgender students reported significantly more substance use and binge drinking than their cisgender peers. While this behavior in part may be accounted for by environmental influences in the college experience, the significantly higher rates of substance use compared to their cisgender peers may suggest an attempt to cope with marginalization.

Nonetheless, transgender students are academically resilient. Despite poorer health outcomes, increased rates of discrimination, violence, and higher rates of impairment to academic success, transgender students generally report the same GPA scores as their cisgender peers. This demonstrates persistence and resilience among this population, at least academically.

Limitations

Prior to thinking about the implications of these findings, it is important to recognize the limitations of this study — terminology, sample size, measurement, and intersectionality. Gender identity and the terminology used to describe it can be fluid. Therefore, it can be difficult to capture the needs and experiences of transgender college students because there are substantial variations in how individuals may identify themselves. For example, in a survey of 925 transgender youth, 60% did not identify with the term "transgender," but rather identified with both genders, (n)either gender, or were more gender expansive, or gender fluid.[12] Alternatively, some people may not select transgender as a gender identity option because they may identify more as the gender they have transitioned to or identify with other terminology. This is validated in the 2015 U.S. Transgender Survey[7] where 12% of survey respondents did not identify with the term "transgender." The term transgender is used in this paper because it is still the most consistently used term in the research and was the gender identity terminology used on the survey. The NCHA-ACHA survey is additionally limiting in that there were no options for more specific gender identities such as tran smale[21] or trans female.[22] This restricts the research from being able to determine differences between male and trans male or female and trans female students and imposes a singular interpretation of experiences across a varied group of students.

Second, while the overall sample size in this study was large, there was an uneven ratio of transgender students to male and female students. Even with this extreme allocation ratio, there was a large enough sample and were large enough differences between group proportions and means to determine statistical significance across most outcomes. The small sample size of transgender students may have limited the ability to determine significance in the measures of condom use, in that only students who were actively engaged in that behavior were included in the analyses. This reduced the number of available observations and may have impacted power for the condom use measures.

This secondary data analysis was limited in its ability to comprehensively measure academic success. The

only available survey item to measure of academic success was GPA. While other measures would have been beneficial to demonstrate a fuller experience of academic success, this study was limited in its ability to do so.

Lastly, due to the smaller sample size of transgender students, there were not enough observations to look at the health experiences and outcomes of transgender students in an intersectional way that considers racial and ethnic differences among this population. This is critically important because research suggests that transgender people of color often experience compounded discrimination and more significant health disparities when compared to their white peers. For example, the U.S. Transgender Survey demonstrated that 1.4% of total respondents were living with HIV compared to 0.3% in the general population. However, the rate among Black respondents was substantially higher (6.7%) and the rate for Black transgender women was a staggering 19%.[7] Furthermore, among the 53 known transgender victims of homicide from 2013–2015, at least 46 (87%) were transgender people of color.[13]

Conclusions

ACHA's trans-inclusive best practices charge health professionals in higher education with developing prevention strategies to address issues that "disproportionately affect transgender individuals."[2] These findings demonstrate that transgender college students are also disproportionately impacted by health and safety concerns, which is consistent with the general population of transgender Americans.[7] Therefore, it is imperative that health care providers, mental health professionals, sexual violence prevention specialists, and other health promotion educators receive training in how to best meet the needs of these students and strategize with other relevant campus partners to develop prevention and intervention efforts to mitigate barriers to personal wellness and academic success.

Additional education and training are incredibly important, as so many transgender adults report high levels of discrimination when seeking health care and consequently avoid or delay care due to such mistreatment. One-third (33%) of respondents in the 2015 U.S. Transgender Survey reported at least one negative experience with a health care provider in the past year related to being transgender, such as verbal harassment, refusal of treatment or service, or having to teach a provider about transgender people to receive appropriate care.[7] Another survey found this rate to be as high as 70%.[23]

While some universities may have policies in place to protect students from outright discrimination and refusal of service in their university health centers, many health care providers and educators receive inadequate training in transgender health[24,25] which can lead to transgender individuals avoiding or delaying care. Such delays have been strongly associated with worse health outcomes for transgender individuals.[26] The findings of this project demonstrate that a large number of transgender college students seek out campus health services at least for mental health care, which makes their contact with clinicians an opportunity or threat to their wellbeing depending on the training of the professional. Therefore, while college health professionals are not necessarily driving the disparities demonstrated in this population, there is an established need for them to play a significant role in reducing these disparate outcomes once students arrive on campus. It is imperative that clinicians become adequately trained in meeting their health and education needs or else they risk further harming the students and/or discouraging them from seeking further services. Additionally, it is critical that health educators become trained in developing and implementing culturally competent primary prevention and education efforts to complement the work happening in clinical spaces and possibly motivate students to seek out their campus' inclusive health care programs.

Future research should specifically compare the health experiences and outcomes of tran smale and male, and trans female and female students to determine differences and similarities in health behavior and outcomes. Considering that several surveys have demonstrated that a substantial number of individuals use different terms outside of "transgender" to describe their gender identity, future research should consider the health experiences and outcomes of nonbinary[27] students who do not identify as transgender.[7,12,14] Lastly, future research should be more intersectional in considering and exploring the unique and shared experiences among different racial and ethnic groups within the transgender student population.

Conflict of interest disclosure

The authors have no conflicts of interest to report. The authors confirm that the research presented in this article met the ethical guidelines, including adherence to the legal requirements, of the United States. Institutional Review Board approval was not required.

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